INTERIOR WALLBOARD AND METHOD OF MAKING SAME

CROSS REFERENCE TO RELATED APPLICATIONS

This application claims the benefit under 35 U.S.C. 119 (e)(1) of prior filed provisional application 60/534,364 filed on Jan. 6, 2004 and 60/511,638 filed on Oct. 17, 2003.

FIELD OF THE INVENTION

This invention relates to an improved gypsum wallboard faced with a glass fiber mat. More particularly, the present invention relates to a gypsum wallboard covered with a glass fiber mat, especially a coated glass mat suitable for interior use. The glass mat faced gypsum board of this invention is suitable for Level 4 finishing (GA-214-96).

BACKGROUND OF THE INVENTION

The building industry widely uses gypsum wallboard, consisting of a core of set gypsum sandwiched between two sheets of multi-ply paper facing material in the construction of residential homes, commercial buildings, and other structures. The use of paper-faced gypsum wallboard has become one of the most common means of finishing the interior structure of buildings. Paper-faced gypsum wallboard, also known as sheetrock or drywall is usually manufactured (precut) in flat sheets of 4 ft. by 8 ft., or 4 ft. by 12 ft., typically having a thickness of ½" or ⅝". The sheets of the paper-faced gypsum wallboard are hung on wood or metal studs to form the interior partitions or walls of rooms, elevator shafts, stairwells, ceilings and the like.

Conventional paper-faced gypsum wallboard is typically manufactured from a slurry of stucco (calcined gypsum slurry) wherein the slurry is placed between two layers of multi-ply paper facers and the slurry is allowed to set. In typical paper-faced gypsum wallboard, the two layers of multi-ply paper facers contain/restrain the slurry while it sets and provides the strength required in installation and use. The set gypsum is a hard and rigid product obtained when the calcined gypsum reacts with water to form calcium sulfate dihydrate.

During wallboard production, water in excess of that needed to hydrate the calcined gypsum must be removed from the slurry during the curing. While a certain amount of water is required to hydrate the calcined gypsum, excess water must be added, e.g., on the order of two, or more times than that actually needed to hydrate the calcined gypsum, in order to obtain a smooth, free-flowing slurry suitable for transporting and then depositing on the facing sheet to form the board core. This excess water must be evaporated primarily through the facing sheets as the board is cured and dried.

Gypsum wallboard is typically made as a continuous product on an endless conveyor using rolls of the paper facing material. The board is cut into discrete lengths to accommodate subsequent handling and then dried in heated dryers until the discrete boards are completely dry. The quality of the paper facers determines the kind of applications suitable for using the boards and the surface treatments that may be used on the boards.

The paper facers usually employed in the production of paper-faced gypsum wallboards consist of two types. The facer used on the side of the wallboard intended to face the interior of a room is of a multi-ply construction with the outer plies usually composed of a better grade of paper. This allows

the smooth surface board to be finished in a variety of aesthetically acceptable ways, especially by painting. The inner plies, including the one that contacts with the board core is usually made of repulped newsprint and recycled corrugated boxes. The paper facer used on the backside of the board is usually made of a plurality of plies of the lower grade of paper, e.g., the repulped newsprint and corrugated boxes.

Multi-ply paper facings have long been used because they provide a unique combination of properties. Paper is able to form a satisfactory bond with the set gypsum, particularly gypsum with added binder, e.g., starch, so that the facing is not easily delaminated from the set gypsum core. As noted above, water that is added to prepare the gypsum slurry and that does not chemically combine with the stucco (calcined gypsum) must evaporate mainly through any facing sheets without causing delamination. Paper is sufficiently porous to allow the water vapor to permeate through it during gypsum wallboard manufacture. Paper also presents a smooth surface that can easily be finished in a number of ways, such as by application of wallpaper or especially by painting, with minimal surface preparation.

Although paper is a relatively inexpensive facing material and is easily used in the process of manufacturing wallboard, it has disadvantages, particularly with regard to moisture-resistance. Moisture can have deleterious effects upon paper-faced wallboard. In addition to degrading strength and other structural properties, moisture (in combination with other factors) can encourage the growth of fungi (including, e.g., mold). The problem can (under certain circumstances) be particularly acute with regard to certain spaces that, upon installation of the wallboard, are enclosed and inaccessible.

As an alternative to paper facing, gypsum wallboard can also be manufactured with a fibrous mat (such as a mat of glass fibers) as a facing material. Examples of such wallboards include those described in, e.g., U.S. Pat. No. 3,993,822, U.S. Pat. No. 5,644,880, U.S. Pat. No. 5,791,109, U.S. Pat. No. 5,883,024 and U.S. Pat. No. 6,001,496. In addition to improved water resistance, fibrous matting, and especially glass fiber matting often provides significant improvements in strength and other desired structural attributes.

Although such fibrous mats may be a more advantageous facing material than paper in many respects, particularly with respect to their moisture resistance for exterior applications, it is less desirable than paper in other respects. In particular, the prior art wallboard products made with glass or other similar fiber mat facing materials provide a less desirable (generally more irregular or rough) wall surface for finishing in many applications and thus less aethetic. Interior walls, for example, are often finished with paint or wallpaper. While paper facing offers a smooth surface for painting or papering, the prior art fibrous facing and especially common glass fiber facing sheets, do not.

BRIEF DESCRIPTION OF THE DRAWINGS

The features and advantages of the invention will be apparent from the following more detailed description of certain embodiments of the invention and as illustrated in the accompanying drawings in which reference characters refer to the same parts throughout the various views. The drawings are not to scale, emphasis instead being placed upon illustrating the features of the invention.

FIG. **1** is a schematic cross section of a coated glass mat faced wallboard according to the present invention.